



For 40 years, engineer Larry Taylor has been helping INL safely process and handle used nuclear fuel and radioactive waste.

INL engineer still in his element after 40 years of contributions to nuclear fuel and waste handling

By [Brett Stone](#), INL Communications & Governmental Affairs

Some things just fit. Most people have had the experience: whether it was buying a pair of shoes, moving into a neighborhood or cooking a new recipe that turned out just right. Sometimes circumstance, timing and characteristics sync in a way that results in a satisfying, long and mutually beneficial relationship.

That seems to be what happened 40 years ago when Larry Taylor first came to work at Idaho National Laboratory. Even though no one else in his family before or after him so far has been involved in the nuclear or related fields, the "shoe" fit well, and Taylor says he's enjoyed his stay here in eastern Idaho.

"If I hadn't liked it, I wouldn't have put up with it for 40 years," Taylor said with a chuckle.

Born in Montana, Taylor grew up in Boise before going to New Mexico State University, where he studied chemical engineering. Taylor's father was originally from Grant, Idaho, not far from INL. So, when Taylor came to work as a summer student for a few months in 1969, it was something of a homecoming for him.

"It's strange that I ended up back here, probably 15 miles from where [my father] was born."

Taylor's work at INL has meshed well with the needs of the lab. When he arrived in 1970, the Waste Calcining Facility (WCF) had just started up its fourth campaign, and the New Waste Calcining Facility (NWCF) was not yet in the planning phase. With his WCF processing experience, Taylor was able to help the NWCF go from drawing board concept to becoming one of the most successful facilities in the desert.

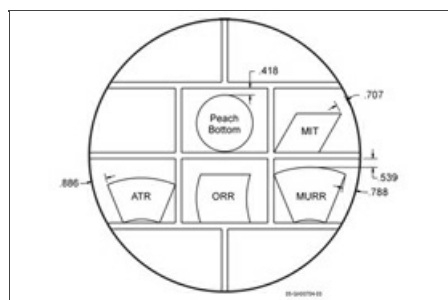


A vessel used to process liquid radioactive waste into a granular solid, at INL's New Waste Calcining Facility.

The NWCF was built to replace an older facility that turned liquid radioactive waste into a granular solid, a process known as "calcining." The previous facility had taken 20 years to calcine about four million gallons of waste. Taylor, as part of the NWCF project team, was able to design, construct and test a facility that calcined more than one million gallons in its first 14 months of operation. The large amounts of calcined material, which looks similar to laundry detergent, can now be more conveniently and safely handled.

"That was my start of kind of a baptism by fire in process engineering," said Taylor, adding that this was one of his favorite projects. His work involved identifying and implementing improvements in areas such as the in-bed combustion process, and instrumentation and controls, especially at start-up.

He and his colleagues identified ignition lag-times that allowed the process start-up to occur at lower temperatures than before. This saved the plant time and money, cutting down warm-up time by more than 25 percent.



A diagram of how spent nuclear fuel from

Since then, Taylor has been involved in a variety of projects and now works on developing ways to safely package used nuclear fuels for transport and storage. After fuel assemblies finish their time in a reactor's core, they are eventually packed for transport and long-term storage. Several assemblies are put into canisters that are typically only 18 inches in diameter. Taylor's job is to design the right combination of packaging materials and arrangements that will keep the materials from "going critical" – starting a self-sustaining chain reaction that could result in additional radioactive release.

Keeping the rods packaged and noncritical is no small task considering the conditions engineers must imagine. Taylor and his co-workers develop designs that can withstand accident scenarios. For example, in a disposal scenario, Taylor must deal with a container whose outer package is

various reactors might fit inside a canister somehow damaged and allows water to come in contact with the inner parts of the container, thus *designed for storage, transport and disposal.* altering their chemistry and configuration of the fuels.

When he's not dealing with these kinds of complicated issues, Taylor has found it easy to mesh his recreational pursuits with eastern Idaho's offerings. For 28 years, he volunteered with the Grand Targhee Ski Patrol. He also served for seven years with the 116th Combat Engineers in the National Guard. Currently, he works as a National Rifle Association firearms instructor, teaching people about the proper use of firearms. He also enjoys competing in tactical pistol target shooting.

Soon he'll have lots more time for those activities — Taylor is retiring from INL next month, and his last day of work will be July 9. Looking to the future, Taylor says he's not sure where he'll eventually retire. Probably, he says, in Idaho. So far, it just seems like a good fit.

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